



MEETING ABSTRACT

Open Access

Comparison of postural control with different customized foot orthoses on isolated subtalar arthrodesis

E Ceccaldi^{1,2}

From 4th Congress of the International Foot and Ankle Biomechanics (i-FAB) Community
Busan, Korea. 8-11 April 2014

Background

Studies describe subtalar and ankle arthrodesis as a factor altering the biomechanics of the foot during walking [1-3] whereas postural control appears physiological [3]. Furthermore, foot orthoses (FOs) are also recognized for their actions on dynamics [4] and balance [5] but not for their postural impact on an isolated subtalar arthrodesis (ISA). Previous studies have shown that depending on the type of FOs [6] and along the comfort felt by the subject [7], the variations induced by different FOs were significantly different. The aim of this study was to compare effects of different types of FOs on balance of patients with an ISA. Two subjects with ISA were volunteers for one session of three repeated measures: without FOs (Control), with Classical FOs (FOsC) and with Molded FOs (FOsM). After a clinical examination, these two types of FOs are custom-made including same posting. We compared postural variations through a force platform with shoes. Three modalities have been demanded at each measure: Normal stance, One-leg stance on the ISA (OnISA) and One-leg stance on the control foot (OnControl). Three data's have been compared: Center of Pressure Area (CoP), CoP Movement (MoV) and Mean Velocity (Vel). The perception of comfort was evaluated by using previously established footwear comfort measures [7]: 100mm visual analog scale (VAS).

Results

Using the VAS, subjects didn't feel a real comfort in their shoes without FOs (VAS=47,5mm). FOs increased VAS (>17,9mm). Thus, FOsM were perceived as significantly more comfortable than FOsC, respectively 97mm

and 65,5mm. Postural assessment showed the CoP (Figure 1), the MoV (Figure 2) and the Vel (Figure 3) were improved by both FOs with Normal stance. For OnISA, the data's indicate postural control was significantly altered by FOsC and improved by FOsM. For OnControl, postural control was more improved by FOsC.

Conclusions

FOs induced different effects on the balance of subjects with ISA depending on orthoses type and parameters observed. FOsM appear as clearly preferable to improve postural control on an ISA. The comfort is significantly improved by FOs and much more by FOsM. The data suggests correlations between improvement of balance and perception of comfort for patients with an ISA.

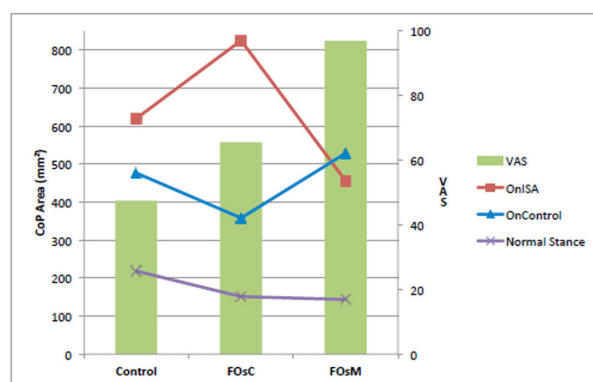


Figure 1 CoP Area in mm²

Correspondence: ceccaldi.podologie@gmail.com

¹Applied Podiatry College, 7 Treguel, 86000 Poitiers, France

Full list of author information is available at the end of the article

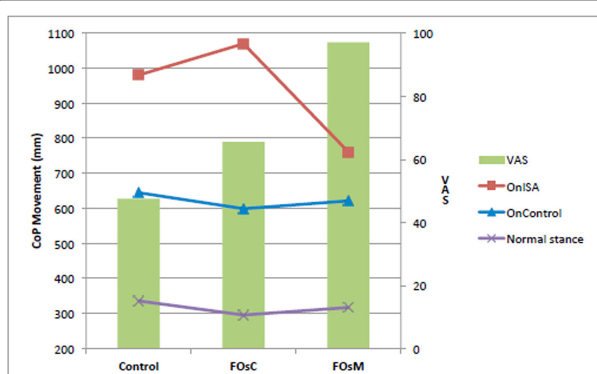


Figure 2 CoP Movement in mm

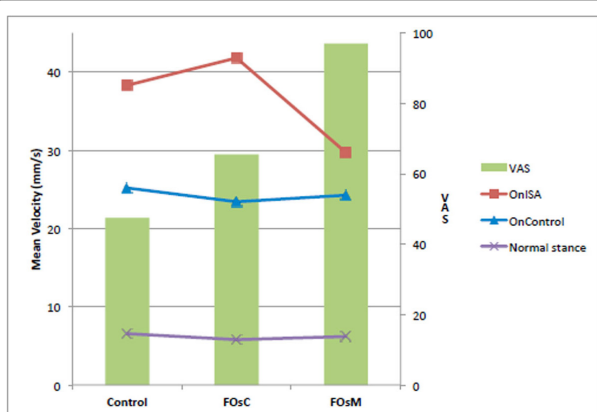


Figure 3 Mean Velocity in mm/s

Authors' details

¹Applied Podiatry College, 7 Treguel, 86000 Poitiers, France. ²Podiatrist, Office, 35 rue Sermonoise, 77380 Combs-la-Ville, France.

Published: 8 April 2014

References

1. Wu WL, et al: Lower extremity kinematics and kinetics during level walking and stair climbing in subjects with triple arthrodesis or subtalar fusion. *Gait Posture* 2005, **21**(3):263-70.
2. Rouhani H, et al: Multi-segment foot kinematics after total ankle replacement and ankle arthrodesis during relatively long-distance gait. *Gait Posture* 2012, **36**(3):561-6.
3. Flavin R, et al: Comparison of gait after total ankle arthroplasty and ankle arthrodesis. *Foot Ankle Int* 2013, **34**(10):1340-8.
4. Telfer S, et al: Dose-response effects of customised foot orthoses on lower limb kinematics and kinetics in pronated foot type. *J Biomech* 2013, **46**(9):1489-95.
5. Gross, et al: Effects of foot orthoses on balance in older adults. *J Orthop Sports Phys Ther* 2012, **42**(7):649-657.
6. McPoil TG, et al: Effect of foot orthoses contour on pain perception in individuals with patellofemoral pain. *J Am Podiatr Med Assoc* 2011, **101**(1):7-16.
7. Mills K, et al: Influence of contouring and hardness of foot orthoses on ratings of perceived comfort. *Med Sci Sports Exerc* 2011, **43**(8):1507-12.

doi:10.1186/1757-1146-7-S1-A13

Cite this article as: Ceccaldi: Comparison of postural control with different customized foot orthoses on isolated subtalar arthrodesis. *Journal of Foot and Ankle Research* 2014 **7**(Suppl 1):A13.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

